

Appl. No. 10/052,966
Atty. Docket No. G-271ML (CP-1230)
Amdt. dated July 11, 2007
Reply to Office Action of April 11, 2007
Customer No. 27752

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REMARKS

Amendments to the Claims

Claims 1-3, 7-9, and 25 are pending in the present application. Claims 4-6 and 10-24 have been previously canceled. No additional claims fee is believed to be due.

Claims 1-2, 8, and 25 have been amended as shown above. Support for these amendments can be found in the original claims, at page 2, line 22 to page 4, line 9, at page 5, lines 1-11, and at page 21, lines 10-21 of the specification.

It is believed these changes do not involve any introduction of new matter. Consequently, entry of these changes is believed to be in order and is respectfully requested.

Rejection Under 35 USC §102(b) Over European Patent Application No. 122523 to Muller and Mustacchi

Claims 1, 2, and 25 have been rejected under 35 U.S.C. §102(b) as being anticipated by European Patent Application No. 122523 to Muller and Mustacchi (the '523 application). The Office asserts that the '523 application teaches intermediate compounds for the preparation of azo compounds comprising benzenediol compounds, comprising 1,3 benzenediol, 2-(4-morpholinomethyl) compounds and thus anticipates claim 1, 2, and 25. Applicants respectfully traverse the rejection.

As currently amended, Applicants' claim 1 recites a compound of claimed formula (1), where R₁ is selected from the group consisting of a hydrogen atom, C₁ to C₅ alkyl, C₁ to C₅ mono or dihydroxyalkyl, and phenyl or benzyl optionally substituted with a hydroxyl, amino or C₁ to C₃ alkoxy group, and R₂ is selected from the group consisting of C₁ to C₅ mono or dihydroxyalkyl, and phenyl or benzyl optionally substituted with a hydroxyl or amino group. Claim 2, as currently amended, recites a compound of claim 1 where R₁ is selected from the group consisting of a hydrogen atom, a C₁ to C₃ alkyl group, and phenyl or benzyl optionally substituted with an alkoxy group, and R₂ is selected from the group consisting of phenyl and benzyl. Finally, claim 25 has been amended to reflect the amendments made to claim 1, i.e., claim 25 does not currently recite any compounds where R₁ and R₂, together with the nitrogen atom to which they are attached, form a ring.

Applicants' amended claims 1, 2, and 25, therefore, do not cover a compound of formula (1), where R₁, R₂, and the nitrogen atom to which they are attached form a

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morpholine ring, as disclosed in the '523 application. Accordingly, Applicants' claims 1, 2, and 25 are novel over the '523 application.

Rejections Under 35 USC 103(a) Over European Patent Application No. 122523 to Muller and Mustacchi in view of Emilsson et al.

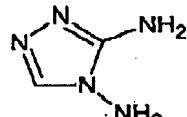
Claim 3, 7-9, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over European Patent Application No. 122523 (the '523 application) in view of Emilsson et al., European J. of Medicinal Chemistry, 20(4), pages 333-337, 1985 ("Emilsson"). The Office asserts that the '523 application teaches intermediate compounds for the preparation of azo compounds comprising benzenediol compounds, comprising 1,3-benzenediol, 2-(4-morpholinomethyl) compounds. The Office further asserts that the '523 application teaches that such compounds are the Mannich reaction product of formaldehyde, resorcinol, and an organic amine. The Office thus asserts that the '523 application teaches the claimed reaction with a resorcinol instead of dimethoxybenzaldehyde. The Office asserts that the abstract of Emilsson et al. shows a reaction between 2,6-dimethoxybenzaldehyde with an amine. The Office asserts that it would have been obvious for one of ordinary skill in the art to employ a resorcinol or a dimethoxybenzaldehyde compound of Emilsson and still result in the of 1,3-benzenediol, 2-(4-morpholinomethyl) of the '523 application. Applicants respectfully traverse the present rejection based on the following comments.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some apparent reason to combine reference teachings (USPTO Memorandum on KSR Int'l. Co., v. Teleflex, Inc., May 3, 2007; KSR Int'l. Co., v. Teleflex, Inc., No. 04-1350 (US, Apr. 30, 2007)). Second, there must be a reasonable expectation of success. Finally, the prior art references, when combined, must teach or suggest all the claim limitations (MPEP 2143).

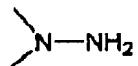
The combination of the '523 application and Emilsson does not teach or suggest all of Applicants' claim limitations and, therefore, does not establish a prima facie case of obviousness (MPEP 2143.03). As currently amended, Applicants' claim 7 recites a process for the preparation of a compound of formula (1) of claim 1, as amended, where R₁ and R₂ are defined as in amended claim 1.

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As discussed above, the '523 application discloses 1-morpholinomethyl-2,6-dihydroxybenzene. The Emilsson publication, on the other hand, discloses a reaction



between 2,6-dimethoxy-benzaldehyde and compound C,



compound AK. Importantly, the reaction occurs via the linkage of compound C.

According to amended claim 7, 2,6-dimethoxy-benzaldehyde is reacted with an amine, R₁R₂-N-H, to produce different benzene-1,3-diol compounds, namely benzene-1,3-diol compounds where R₁ is selected from the group consisting of a hydrogen atom, C₁ to C₅ alkyl, C₁ to C₅ mono or dihydroxyalkyl, and phenyl or benzyl optionally substituted with a hydroxyl, amino or C₁ to C₃ alkoxy group, and R₂ is selected from the group consisting of C₁ to C₅ mono or dihydroxyalkyl, and phenyl or benzyl optionally substituted with a hydroxyl or amino group. The claimed benzene-1,3-diol products are not taught or suggested by the '523 application. The 1-morpholinomethyl-2,6-dihydroxybenzene compound of the '523 application has been found to be too bulky to penetrate into a hair fiber and thereby undergo a color reaction in the hair fiber. 1-morpholinomethyl-2,6-dihydroxybenzene and similar compounds, i.e., compounds of formula (1) where R₁, R₂, and the nitrogen atom to which they are attached form a 5- or 6-membered ring, have not been found to effectively produce color in the hair.

With regard to the amine reactant of claim 7, R₁R₂-N-H, the Office itself has acknowledged that R₁R₂-N-H is completely different from compound C of Emilsson (Office Action, page 3). Moreover, the claimed reaction occurs at a -NH₂ group *bonded to a carbon*, rather than a -NH₂ group *bonded to a nitrogen atom*, as in Emilsson. It must be further noted that, in Emilsson, the -NH₂ group that is bonded to the ring carbon of compound C does not take part in the reaction. In addition, the reaction product of the Emilsson reference, compound AK, is very different from the compounds produced by the



process of claim 7. Among other things, compound AK contains a

linkage.

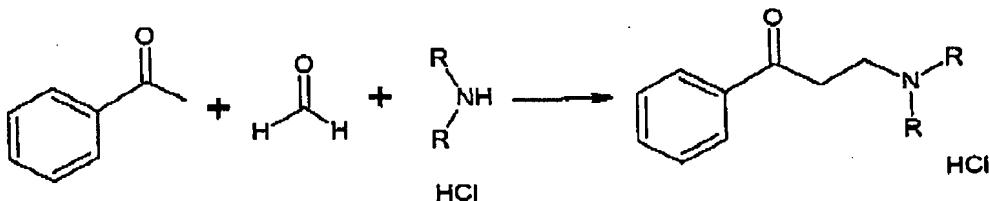
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Because the '523 application does not teach or suggest the benzene-1,3-diol products of the reaction of claim 7 and because the reactants and products of the Emilsson reaction are different from those recited in claim 7, the combination of the '523 application and the Emilsson publication does not teach or suggest all of Applicants' claim limitations.

Furthermore, there is no apparent reason to combine the elements of the '523 application and the Emilsson publication. In formulating a rejection under 35 U.S.C. § 103(a) based upon a combination of prior art elements, it *remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed* (USPTO Memorandum on KSR Int'l. Co., v. Teleflex, Inc., May 3, 2007; KSR Int'l. Co., v. Teleflex, Inc., No. 04-1350 (US, Apr. 30, 2007)). The reason to combine references should be made explicit. In this case, the Office has not presented, explicitly or implicitly, a reason to combine the elements of the '523 application and the Emilsson publication. In this case, there is no reason to combine these two disparate references.

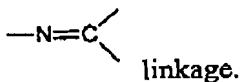
The '523 application discloses a diazotype reproduction material that contains 1-morpholinomethyl-2,6-dihydroxybenzene as a coupling agent. The diazotype process is a printing process used for copying engineering drawings and similar materials. The diazotype process utilizes reproduction material that comprises a light-sensitive diazo composition affixed to a support base, such as paper or film. The light-sensitive diazo composition contains a light-sensitive diazonium salt and a "coupling agent," not to be confused with the couplers used in oxidative hair coloring. After exposure of the diazo composition to ultraviolet light, the coupling agent, i.e., 1-morpholinomethyl-2,6-dihydroxybenzene, reacts with undecomposed diazonium salt to form an azo dye. The '523 application teaches that the coupling agent, i.e., 1-morpholinomethyl-2,6-dihydroxybenzene, is the product of a Mannich reaction of formaldehyde, resorcinol, and an organic amine. A Mannich reaction is defined as the "reaction of active methylene compounds with formaldehyde and ammonia or primary or secondary amines to give β -aminocarbonyl compounds" (Hawley's Condensed Chemical Dictionary, Lewis, Richard J., Sr., 14th Edition, 2002). The Mannich reaction is exemplified below:

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(from **Microwave Assisted Organic Synthesis**, Tierney, Jason P. and Lidström, Pelle, 2005, Blackwell Publishing).

In contrast, the Emilsson publication teaches the synthesis of an *antihypertension agent*, 3-amino-4-(arylideneamino)-4H-1,2,4-triazole (compound AK). The synthesis involves the reaction of 2,6-dimethoxy-benzaldehyde and compound C, described above, to yield compound AK. The Emilsson synthesis reaction is wholly different from the Mannich reaction taught in the '523 application. The reaction occurs at a -NH₂ group bonded to a nitrogen atom, rather than at a -NH₂ group bonded to a carbon atom, as in the process of the '523 application. Of note, in the '523 application, the Mannich reaction used to produce 1-morpholinomethyl-2,6-dihydroxybenzene does not occur at a -N-N-linkage, because there are no -N-N- linkages in the reaction of formaldehyde, resorcinol, and an amine (defined in Hawley's Chemical Dictionary as "derived from ammonia (NH₃) by replacing one or more of the hydrogen atoms with alkyl groups"). Moreover, the product of the Emilsson process, compound AK, is entirely different from the 1-morpholinomethyl-2,6-dihydroxybenzene of the '523 application. Among other things, compound AK, unlike 1-morpholinomethyl-2,6-dihydroxybenzene, contains a



Given the significant differences outlined above between the reaction taught in the *diazotype printing process* of the '523 application and the reaction taught in Emilsson to produce an *antihypertension agent*, there is no apparent reason to combine the two references. Nor would one skilled in the art expect an amine, R₁R₂-N-H, to react with resorcinol or 2,6-dimethoxy-benzaldehyde to successfully yield the 1,3-benzenediol, 2-(4-morpholinomethyl) of the '523 application. The Emilsson reaction and the reaction of the '523 application are not compatible and the reactants and products of the two reactions are not interchangeable. Furthermore, as acknowledged by the Office, neither reference teaches the step of deprotection, a required element of claim 7.

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Accordingly, the combination of the '523 application and the Emilsson publication fails to establish a *prima facie* case of obviousness with respect to Applicants' claim 7. Amended claim 8 depends on claim 7 and is therefore patentable for the same reasons as claim 7. With regard to claims 3 and 9, the '523 application does not appear to be relevant to either of these claims. The Applicants respectfully submit that these rejections are in error and should be withdrawn. Finally, amended claim 25 does not recite a process for the preparation of a compound, and it does not recite 2-morpholin-4-yl-methyl-benzene-1,3-diol or similar compounds. Claim 25 is therefore patentable, as well.

CONCLUSION

In light of the amendments and remarks presented herein, it is requested that the Examiner reconsider and withdraw the present rejections. Early and favorable action in the case is respectfully requested.

Applicant has made an earnest effort to place their application in proper form and to distinguish the invention as now claimed from the applied references. In view of the foregoing, Applicant respectfully requests reconsideration of this application and allowance of Claims 1-3, 7-9, and 25.

Respectfully submitted,

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